

AMENDMENTS TO THE CLAIMS

Claim 1 (Currently amended): A detector for ionising radiation comprising a first relatively thick layer of diamond material and a second relatively thin layer of diamond material adjacent to the first layer, the layers being connected electrically to a common contact, the first and second layers being ~~optimised~~ designed for the detection of different types of radiation or for the detection of different parameters of a particular type of radiation, with respective first and second contacts connected to the first and second layers, so that the detector simultaneously provides first and second output signals corresponding to radiation incident on the ~~detector elements~~ first and second layers of diamond material.

Claim 2 (Original): A detector according to claim 1 wherein the common contact comprises a metallic or semi-conductor layer between the first and second diamond layers.

Claim 3 (Original): A detector according to claim 2 wherein the common metallic or semi-conductor layer comprises a material selected from the group consisting of titanium, tungsten, molybdenum and boron doped diamond.

Claim 4 (Previously amended): A detector according to claim 1 wherein the first layer has a thickness of between 0.3 mm and 1.5 mm.

Claim 5 (Original): A detector according to claim 4 wherein the first layer has a collection distance of at least 20 μm .

Claim 6 (Original): A detector according to claim 5 wherein the first layer has a collection distance of at least 50 μm .

Claim 7 (Original): A detector according to claim 6 wherein the first layer has a collection distance of 300 μm or more.

Claim 8 (Currently amended): A detector according to claim 1 wherein the first layer is ~~optimised~~ designed for the detection of beta particles, x-rays and gamma rays.

Claim 9 (Previously amended): A detector according to claim 1 wherein the second layer has a thickness of between 10 μm and 40 μm .

Claim 10 (Currently amended): A detector according to claim 1 wherein the second layer is ~~optimised~~ designed for the detection of alpha particles.

Claim 11 (Previously amended): A detector according to claim 1 further including respective conductive layers on the outer surfaces of the first and second layers of diamond material.

Claim 12 (Previously amended): A detector according to claim 11 wherein the conductive layers comprise a material selected from the group consisting of titanium, tungsten, molybdenum and boron doped diamond.

Claim 13 (Previously amended): A detector according to claim 11 including respective active contacts connected to the conductive layers.

Claim 14 (Previously amended): Radiation detector apparatus comprising a detector according to claim 1, bias means arranged to apply respective bias voltages to the first and second diamond layers, and first and second amplifiers having inputs connected to the first and second diamond layers and arranged to generate respective first and second amplified output signals corresponding to radiation incident on the layers.